Cohort Approach Achieves Results with Small-to-Medium Business in Montana

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ABSTRACT

The Small-to-Medium Business (SMB) segment has historically been a difficult group to engage in energy efficiency offerings. SMBs make up 25% of global industrial energy use, but because they fall between the mass market approach of residential/commercial and the customized approach of large industrial, they have been underserved. For facilities in rural locations, these problems have been compounded by reduced access to program resources.

For years utility programs have deployed Strategic Energy Management (SEM), a series of management system practices that target energy improvement, to create reliable and persistent energy savings. These utility programs began by applying SEM with very large industrial users in a consultative, one-on-one format. More recently, these SEM programs have targeted smaller size customers, using cohorts as a way to deploy SEM more cost-effectively to groups of facilities. However, to date there have been customer size thresholds that these programs have not been able to cross; when working with SMBs, these programs have not been able to scale down the customer support level at a rate commensurate with the potential savings available from these smaller facilities.

In 2011, the Northwest Energy Efficiency Alliance (NEEA) and NorthWestern Energy (NorthWestern) launched a two-year project to deploy SEM with smaller industrial customers in Montana. This effort has leveraged combinations of innovative approaches to drive results in SMBs across Montana's wide geography. This paper will provide details on the project design, results of the first one-year cohort engagement that finished in summer 2012, and anticipated results of the second cohort that completes their effort in summer 2013.

SEM Background

For over 20 years, utility energy efficiency programs have embraced approaches that engage the business organization, such as providing funding for customer energy managers. The past 10 years has seen further development of a management system approach to energy, where an organization's executive commits to a goal, an energy team takes consistent action on that goal and reports to the executive. As a management system, these elements reinforce each other and lock in results that outlast challenges such as personnel changes or competing priorities. Utility resource acquisition programs from Energy Trust of Oregon (Energy Trust), Bonneville Power Administration (Bonneville), and Xcel Energy have all launched successful SEM programs that produce reliable energy savings.

SEM programs do have challenges: Though formative programs such as NEEA's Continuous Energy Improvement (CEI) effort within their Food Processor Initiative proved that SEM concepts are effective, a lack of available research makes the persistence of SEM adoption and long-term savings unclear. As SEM programs are relatively new, many are trying to make improvements in savings and in how SEM is delivered to the customer. And lastly, SEM

programs have limits on servicing smaller customers while remaining cost-effective.

NEEA has conducted, and continues to conduct, numerous activities to advance SEM deployment. NEEA conducted a foundational SEM project, Continuous Energy Improvement (CEI), for food processors until 2009, producing over 68 million kWh and directly influencing the Energy Trust and Bonneville SEM programs. NEEA built and is currently piloting a web-based SEM curriculum called Online Continuous Energy Improvement (OCEI), targeted at smaller size customers who deploy SEM at their own pace with light-touch consulting. And NEEA provides national leadership in SEM, directly guiding an SEM utility program standard led by the Consortium for Energy Efficiency (CEE).

SEM Cohort Design

In January 2011, NEEA made plans to test an approach with smaller industrial customers across Montana's large geography. This would necessitate a lighter consultant touch, while still engaging the customers and producing results. Through a competitive bid process, NEEA selected EnerNOC to implement the SEM Cohort project.

In initial project launch conversations, the Project Team decided to conduct two cohort engagements, with customers geographically based around certain Montana towns. Given Montana's population centers, the first cohort would have customers from Bozeman and Helena, and the second cohort would have customers from Billings and Great Falls. Due to budget limitations, each cohort would contain approximately five (5) customers. Though some other utility SEM programs lasted for 18 months or more, the Project Team decided to focus the efforts within one year. The wide geography meant that the program would have to provide impact without requiring customers to regularly drive great distances. The Project Team anticipated that the customers would not want to meet in-person more frequently than quarterly. To address the budgetary and geographical limitations, the Project Team would utilize a light touch to be effective, deploying webinars in between quarterly workshops, and providing phone-based coaching to support customer progress and momentum.

While participating in the SEM Cohort, the customers would still participate in NorthWestern's energy efficiency programs. As the Project Team identified potential savings opportunities, they would direct the customer to contact NorthWestern, who would engage their local program service providers to conduct audits and drive specific opportunities.

Figure 1 below illustrates the total project timing, with each year-long cohort being preceded by customer recruitment and being followed by savings estimation.

Figure 1. Project Timeline

	2011			2012				2013		
Activity	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
First Cohort										
Recruit cohort participants										
Implement SEM										
Determine cohort savings										
Second Cohort										
Recruit cohort participants										
Implement SEM										
Determine cohort savings										

NEEA established three goals for the project:

1. Have 80% of the cohort participant customers complete the SEM program by July 31, 2013. The two cohorts have a total of ten customers, so eight customers must complete the cohort program to meet this goal. This goal is a traditional indicator of core SEM program effectiveness.
2. Demonstrate that two or more persons from each customer facility in the second cohort utilize the NEEA Online CEI (OCEI) curriculum. NEEA added this goal for the second cohort. EnerNOC would be able to determine customer activity by OCEI utilization reports and through customer conversations. This goal is helpful for NEEA to understand the value that the OCEI curriculum adds to this project.
3. Demonstrate 8,760,000 kWh savings. EnerNOC would estimate savings using facility-wide energy consumption models. This goal would help NEEA understand the savings resulting from a SMB-targeted SEM program.

Recruitment of Participants

During initial project conversations, the Project Team conducted a call with NorthWestern's energy efficiency program managers to discuss potential customers and to refine screening criteria. At the minimum, customers would be required to provide clear executive support; specifically, a senior manager would have to sign the project participation agreement, committing personnel to participate in the cohort activities as well as stating their support to continue their energy program that results from the cohort. In addition, the Project Team established the following optional criteria:

- Customer size: ideally above 150 KW
- Energy data: customer should be able to access their energy data
- Experience: customer should have existing management systems (e.g. quality, environment, food safety) and/or continuous improvement processes (Lean, Six Sigma)
- Energy projects: customer would ideally have a history of doing energy projects

It is important to note that these optional criteria were valued significantly lower than the requirement of clear executive support. For example, the last optional criteria, where the customer would ideally have a history of doing energy projects, turned out to be less of a driver for program participation.

With these criteria, the Project Team worked alongside NorthWestern to recruit customers to participate in the cohorts. The Project Team established a customer pipeline to track potential participants. The pipeline enabled the Project Team to ensure that each cohort was populated with the right number of cohort participants, factoring in potential cohort participants dropping out of the recruitment process for various reasons. The potential cohort participants progressed in stages from being aware of the project, to being interested, to committing to the program via signing the agreement. Due to the amount of time required to initiate customer contact, to navigate to appropriate decision makers, such as plant managers or corporate executives, and to gain their commitment to participate, the recruitment process lasted approximately three months. The primary outreach was conducted by NorthWestern as well as

the local Manufacture Extension Partnership, Montana Manufacturing Extension Center (MMEC). MMEC's existing contacts with customer executives were helpful to speed up commitments to participate in the project.

Project Delivery

The project delivery was developed to provide a sequence of topics that would build foundational SEM knowledge and apply SEM concepts in each customer organization.

At the outset of each cohort, the Project Team led an all day kickoff meeting at a NorthWestern facility. In this meeting, EnerNOC confirmed expectations for the year-long project, including how the customers would work together, and to create accountability, underscored the objective that at the end of the project each customer energy team would present their upcoming year's energy management plans for the future to their cohort peers. During the meeting, EnerNOC also laid groundwork on foundational principles, such as:

1. Customers should not focus on perfection, but should strive for iterative improvements
2. Customers should seek help from within their organizations to balance energy team workloads; in addition, customers should engage employees to be aware of energy efficiency and to suggest improvement ideas, resulting in fewer missed opportunities
3. Customers should be honest with themselves and with each other regarding their performance and opportunities to improve

Lastly, EnerNOC facilitated a group Energy Management Assessment (EMA) to help the customers understand their current state, as well as, the priorities they have to tackle in the coming year and beyond. In the first cohort, EnerNOC utilized the ENERGY STAR Facility EMA Matrix. Though this provided value, EnerNOC found that it would be better to provide more detailed EMA feedback after the customers had begun establishing their energy programs. In the second cohort, EnerNOC broke the EMA activity into two: at the outset, EnerNOC utilized a "lighter" EMA to identify high-level areas to improve, and then three quarters into the cohort engagement EnerNOC deployed a more thorough EMA to identify and prioritize remaining improvement areas as each customer neared completion. In both cases EnerNOC queried the customers in core SEM areas, illustrated in Table 1 below.

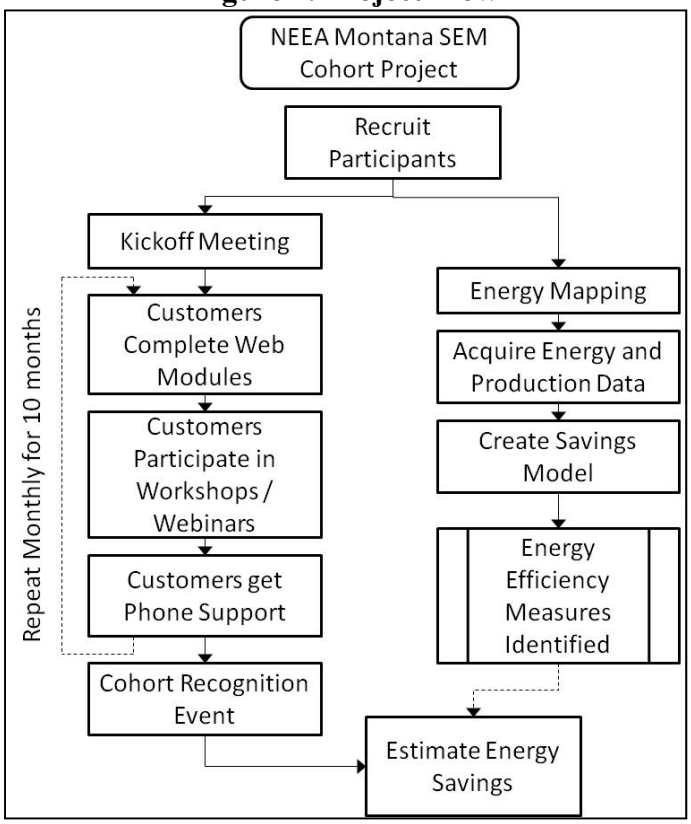
Table 1. Energy Management Assessment Areas

SEM Area	Example Performance
Leadership	Management committed to energy efficiency, but they are not actively tracking energy activities or energy metrics
People	Energy team is not based solely on the personality of the leader (e.g., the team meets when the leader is sick); company employees are engaged to use equipment efficiently and to identify and suggest energy improvements
Metrics	Organization tracks energy consumption, but they have not normalized for production, weather, or other energy drivers
Management Systems	Organization has documented some energy program areas in order to facilitate improvement, but they do not consistently follow-up on these areas

Monthly Workshops and Webinars

With the kickoff meeting complete, EnerNOC initiated monthly activities to establish SEM with each customer. Figure 2 below provides an overview of the project flow for each of the two, year-long cohort engagements. This figure does reflect a change made in the middle of the project, where the OCEI web-based curriculum was added as a program component for the second cohort.

Figure 2. Project Flow



EnerNOC conducted quarterly onsite workshops to convene the cohort in-person, so that the customers would learn in a hands-on environment, exchange ideas with their peers, and create a positive peer pressure dynamic that would encourage individual customers to maintain momentum. The hands-on training activities enabled customers to apply their SEM knowledge from webinars and online modules; for example, EnerNOC guided breakout groups to share their energy policies with each other, explain the rationale for specific energy policy language, and come away with tweaks that they might make to improve their own energy policies to be more effective in communicating their organization's energy vision. The training topics are outlined in Table 2 below. These workshops rotated locations between customer facilities so that customers could learn how their peers were effectively implementing common SEM principles in different operational environments.

While at the customer location for the workshop, the hosting customer led the entire cohort on a facility tour, where they described their operation and pointed out completed or planned equipment improvements. During this walk-through, EnerNOC facilitated discussions between the group as to potential improvement areas, used root cause analysis techniques to ask

why energy was used the way it was and prompt the customers to take no-cost/low-cost improvement actions, and reiterated when equipment opportunities appeared worthy of engaging Northwestern to provide specific expertise. For example, on one tour, EnerNOC pointed out how many of the host customer's production staff used compressed air to clean fine production materials from their clothing. In this case, the customer knew of this misuse, but was not aware of a viable alternative. One of their peer cohort participants described how they had replaced compressed air with hand-held vacuum systems for similar applications, not only to save energy but also to reduce the risk of materials being blown into employees' eyes. The end result of these walk-throughs was that the customers were exposed to the improvement ideas undertaken by their peers, they "learned how to fish" for new potential opportunities in their own locations, and they had a vision on how to take action with their utility's resources.

In between quarterly workshops, EnerNOC conducted monthly educational webinars. In these one hour sessions, EnerNOC trained participants to apply energy management topics such as building high performing energy teams. EnerNOC deployed interactive web surveys and explored best practices in adult distance learning to keep the customers engaged as well as to provide a feedback mechanism for the webinar's performance in terms of engagement and education.

Together, the workshops and webinars provided monthly activities to structure the cohort's progress. In addition, the cohort members were able to interact with each other as a peer group, sharing information on challenges and solutions, driving a high level of engagement. Table 2 below illustrates the second cohort's activity.

Table 2. Cohort Calendar

Month	Format	Topic
July	Workshop	Kickoff, Initial Energy Management Assessment
August	Webinar	Foundational SEM (Energy Teams, Energy Action Plans)
September	Webinar	Energy Data, Energy Consumption Influences
October	Workshop	Energy Mapping, Walkthrough
November	Webinar	Dashboards, NorthWestern Resources
December	-	No activity
January	Webinar	Communicating Energy Management
February	Workshop	Employee Engagement, Walkthrough
March	Webinar	Management Systems
April	Workshop	Group Energy Management Assessment, Walkthrough
May	Webinar	Sustaining your Energy Management Program
June	Workshop	Recognition Event, Final Present-out on Year 2 Program Plans

Monthly activities for Cohort #2, July 2012-June 2013

Web Modules

The Project Team incorporated a change in the second cohort where-in NEEA's Online Continuous Energy Improvement (OCEI) web-based curriculum was incorporated into the customer's activities. NEEA had previously piloted OCEI with other SMB customers and was interested in how the web-based materials might accelerate the cohort performance by delivering key content prior to webinars so that every consultant touch had more freedom to engage

customers and build upon key concepts. OCEI consists of 15 self-paced modules; following is a representative list of some of the topics:

- How to Choose Performance Indicators
- How to Choose the Best Energy Projects
- How to Create Energy Awareness and Support
- How to Improve through Operations and Maintenance
- How to Translate Data into Performance

During the time between each cohort activity, EnerNOC required the customers to complete between two to three training modules on topics pertinent to the upcoming workshop or webinar. Since the customers would have a higher SEM knowledge level coming into each workshop and webinar, EnerNOC could then:

1. Run the workshops and webinars in a more interactive fashion
2. Conduct more hands-on scenarios and examples
3. Answer more customer questions in an expert role
4. Provide more tools
5. Equip the customers to immediately apply concepts

Customer Coaching

Lastly, in between cohort activities EnerNOC provided phone-based coaching to each customer. This concept is similar to how a personal trainer provides individualized attention to increases a workout program participant's performance. EnerNOC encouraged energy teams facing competing priorities, advised on technical issues such as customized metrics for a given facility and maintained communication around expectations for upcoming group events.

At the end of each year-long cohort engagement, EnerNOC conducted a cohort recognition event. Each energy team leader presented their results from the previous year and outlined their plans for the coming year:

- Their energy goal
- How often they will meet as a team, report metrics to execs, and review their program
- Who's on their team, how they will deal with changes and absences
- What executive involvement will look like – what employee engagement will look like
- What challenges they see ahead (busy seasons, budgeting, new employees) – how they will face them; what other risks they anticipate
- What SEM opportunities they see ahead (pet projects, employee awareness)

Executives from each customer company attended the event and the energy team participants received recognition certificates acknowledging their hard work. NorthWestern's CEO provided the keynote speech to the group, and leaders from NEEA, EnerNOC and NorthWestern congratulated the group, presented awards to each energy team, and urged them to maintain their excellence in energy management. This entire recognition event leveraged the public commitment to for each customer to continue their SEM activities after the event.

Technical Activities

In parallel to implementing SEM, EnerNOC conducted technical program activities. To understand each customer's facility as it related to energy and data, EnerNOC conducted an Energy Map exercise at each facility. An Energy Map exercise is designed to understand how energy flows in a facility and to understand how energy and related data is acquired. During the Energy Map exercise EnerNOC worked alongside a customer energy team member to diagram the flow of energy alongside the facility's major processes. For example, in one facility EnerNOC documented how electricity went into motors to move raw materials and how natural gas went to process heating to cook raw materials. The project team documented where and how frequently the facility acquired energy and production data as well as how this data acquisition occurred alongside processing time. For example, EnerNOC documented that the facility acquired data on raw material counts, work-in-process counts, and finished product shipment, and that the timing between raw material coming into the facility and being shipped as a finished product could vary from three days to three weeks. This time lag information helped to diagnose that finished product shipment data should not be used as a production metric for the energy consumption model. For larger facilities which had sub-meters, EnerNOC documented where energy data was acquired within the facility.

Using the knowledge gained from the Energy Map, EnerNOC analyzed energy and production data to establish energy consumption models. The project team deployed a number of statistical analyses to create these models, and conducted internal peer reviews of the models with EnerNOC's evaluation and engineering practice leaders. After creating these models, EnerNOC reviewed the models with each customer to educate on how operations influenced energy savings across the facility. At the end of the effort, around July 2013, EnerNOC will estimate the total SEM project savings and report these to NEEA and NorthWestern.

Post Cohort Activities

After the recognition event, EnerNOC met with the NorthWestern customer service team members to debrief from the cohort activity. In these discussions, EnerNOC reviewed the SEM implementation, discussed the customers' energy performance, their energy efficiency measure opportunities, and guided the utility personnel on how they can best support the customers' ongoing SEM efforts. For example, the utility team members were encouraged to continue to attend energy team meetings, to follow up with the customers regarding their progress to goal, and to ensure program resources were communicated to the teams.

Within both cohorts, some customers picked up the SEM concepts more quickly than others. The prevailing success factor was the existence of top management buy-in and other management systems or continuous improvement processes. The organizations with greater experience in these areas had fewer challenges. Each cohort group had similar challenges; facilities in both cohorts experienced a personnel change in the energy team leader role. This caused some slowdown in energy team activity and cohort engagement, but executives within each organization ensured that momentum was maintained by the energy teams. Each cohort also had a customer whose previous success implementing energy projects made them want to focus solely on the results and not on the continuous improvement process. In these cases,

additional conversations with these customers helped them to understand the SEM process' value and how to apply these concepts to their own organization.

Results

In July 2012, EnerNOC completed the first cohort's implementation. All of the first cohort's participants completed the program. EnerNOC reported initial claimed savings to NEEA; the first cohort saved 3,517,464 kWh. The overall project savings goal is 8,760,000 kWh, so with assuming similar savings for the second cohort, the project would be at 80% of the goal. EnerNOC is currently completing energy savings model development for the second cohort, and have plans to report claimed savings in late summer 2013.

All of first cohort's participants completed the program and presented in front of their peers at the recognition event in Helena, Montana. Attendees included local commissioners and executives, NorthWestern's CEO, and a Helena television station which provided local media coverage. Currently, each customer in the second cohort is actively engaged, and each customer facility has at least two persons who are using NEEA's OCEI web-based curriculum, illustrative of the customer value that OCEI provides. EnerNOC anticipates a recognition event for the second cohort in June 2013. Table 3 below is an overview of results for each cohort.

Customers of the first cohort provided positive feedback on their involvement in the SEM cohort, stating that their effort is paying dividends months after completion of their active cohort participation. One customer cited their cohort involvement as the reason for maintaining energy costs while almost doubling production levels. Other customers have been similarly positive. For the second cohort EnerNOC has added additional survey tools to assess mid-stream customer satisfaction, and preliminary results appear positive. EnerNOC will have final survey results available by July 2013.

From a utility perspective, NorthWestern has been satisfied with the process and what value this has provided to their customers. NorthWestern program managers are examining the possibility of reuniting the first two cohort groups in an annual event to maintain savings momentum as well as to provide a customer service mechanism. Additionally, NorthWestern is looking at options to continue applying SEM via their own program.

Table 3. Results for each SEM Cohort

	Cohort #1	Cohort #2
Customer segments	Mining, light manufacturing, waste water treatment	Food processing, light manufacturing, water treatment
Customer locations	Bozeman, MT; Helena, MT	Billings, MT; Great Falls, MT
Energy Goals	Five customers created energy goals. Four of the five continue to track and report on goals to top management	Three customers created energy goals
Energy Policy/Strategy	Five customers developed an Energy policy that was signed by top management	Three customers developed an Energy policy that was signed by top management
Energy Models	Built 3 customers statistical regression models, 2 customers used models based on weighted moving averages	Regression models built for all customers
Deployment approach	Workshops and webinars	Web-based modules to establish content, workshops and webinars help apply content
Savings	3,517,464 kWh	TBD approx July 2013

To gain a complete picture of customer satisfaction and long-term savings, NEEA may conduct an informal SEM survey of each customer. At the same time, NorthWestern could provide value to the customers by updating their energy consumption models and savings results, helping the local energy teams justify their internal efforts, while at the same time returning savings information to NEEA.

NEEA plans to utilize this project's findings to guide other SEM efforts in the region, specifically to support regional stakeholders to establish SEM programs for smaller sized customers.

Findings for Program Managers

For utility resource acquisition program managers interested in implementing an SEM offering using a cohort approach there are some key considerations that would make the offering more successful:

- **Resources:** EnerNOC utilized individuals with key areas of expertise: Previous experience deploying SEM; Ability to build and use facility-wide savings models with correct balance of accuracy and usability for future use by facility staff; Skills in complex project management; and understanding of successful training environments and techniques. Program managers should place a high priority on finding the right team to support their SEM offering.
- **Recruiting:** For an SEM offering to be successful, the right customers must be recruited to participate. NorthWestern had strong relationships with both cohort's customers, dramatically shortening the time required to establish customer trust on the more sophisticated SEM implementation. NorthWestern and EnerNOC built on the strong relationship and required potential cohort participants to possess a combination of traits, most importantly explicit executive buy-in on the project vision as well as familiarity

with continual improvement approaches. Program managers should apply similar program prerequisites to customers with which they have a strong relationship.

- **Engagement Activities:** EnerNOC used proven engagement experience to implement SEM and to drive energy savings from the effort. One key engagement activity was the Energy Mapping exercise, which helped the customer understand how energy is used and monitored, while also facilitating the questioning of why energy is used the way it is. Program managers should deploy similar deeper dive, facilitated walkthroughs in their SEM program.
- **Tools:** Because of extensive SEM experience EnerNOC brought reliable SEM templates and other tools that greatly simplified and clarified the SEM implementation process for customers. Program managers should leverage existing tools, including some freely available on the websites of the EPA ENERGY STAR's Guidelines for Energy Management and NEEA's EnergyImprovement.org. When NEEA's OCEI platform is made available to regional funding utilities or to the general public, program managers should strongly consider incorporating this into their program.

There are a few challenges that a Program Manager would likely face in rolling out an SEM cohort offering:

- **Maintaining customer momentum:** energy management is never the highest priority for any organization, and competing priorities can quickly stall or even stop the implementation of an organizational approach like SEM. Program managers should recruit customers with experience in long-term, strategic initiative implementation. Then, program managers should require a customer project kickoff meeting at the implementation outset, with attendance and participation from executive level managers; this would be enhanced by similarly attended project milestone meetings. In addition, while program managers cannot make energy management a priority for their customers, they should ensure that their SEM project team utilizes personal skills and marketing techniques to repeatedly sell SEM's value to the customer, as necessary, to maintain project resources and momentum.
- **Having adequate program marketing support:** when conducting the marketing-related activities found in this cohort project, it is important to have sufficient resources. For example, if the program manager wants to create utility-specific energy awareness posters, they may have to work with internal or external marketing personnel. This need is even clearer when conducting a recognition event, where public relations, logistics, and other resources may be required. Program managers should identify these needs as early as possible to appropriately plan and budget for such marketing activities.
- **Working with challenging energy consumption models:** sound and predictive energy consumption models require that the appropriate energy and production data be available. While most program managers are familiar with the challenges of energy data availability, appropriate production data can also be difficult to obtain. Together, these make it difficult to create regression-based energy consumption models that are statistically sound in spite of limited data. Program managers should require that their implementation team be able to apply alternative statistical models to demonstrate energy performance and to estimate savings.

Conclusion

The cohort model has proven effective to deliver SEM to SMBs, customers smaller in size than those typically targeted by most SEM programs. As NEEA encourages Northwest utilities to adopt similar cohort-based programs, other utilities across the country are encouraged to do the same. In the future, as these and other similar programs continually innovate and push the customer size threshold smaller and smaller, a greater number of SMBs will experience the benefits of SEM.

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